

AMENDMENTS TO THE CLAIMS:

The following listing of claims replaces all prior listings, and all prior versions, of claims in the application.

LISTING OF CLAIMS:

1. and 2. (Cancelled).

3. (Previously presented) The fuel cell assembly of claim 47, wherein the thickness of a humidifying water inlet of said humidifier is 1/2 to 3/4 of the thickness of said water-retaining layer.

4. (Cancelled).

5. (Previously presented) The fuel cell assembly of claim 47, wherein said water permeable layer is 0.01 to 0.1 micrometer on a mean micro-pore diameter and 10 to 100 micrometers thick.

6. (Previously presented) The fuel cell assembly of claim 47, wherein said water permeable layer has a porosity of 50 to 90%.

7. (Previously presented) The fuel cell assembly of claim 47, wherein said water permeable layer is one or more layers that are treated to be hydrophilic and are selected from the group consisting of polytetrafluoroethylene, polystyrene, and copolymers of styrene and butadiene.

8. (Previously presented) The fuel cell assembly of claim 48, wherein the water-retaining layer of said humidifier has a carbonaceous porous filter.

9. and 10. (Cancelled).

11. (Previously presented) A power generation system comprising an apparatus which produces or stores a hydrogen containing gas and a fuel cell assembly connected to said apparatus with a piping through which said fuel gas flows, wherein said fuel cell assembly of claim 47 generates electricity using said fuel gas from said apparatus.

12. (Previously presented) The fuel cell assembly according to claim 47, wherein the water-retaining layer has a mean micro-pore diameter of 10 to 300 μm and a thickness of 50 to 300 μm , whereby water is retained by capillary force by said water-retaining layer when the at least one unit fuel cell is not working and is taken by the at least one of the oxidizing gas and the fuel gas against the capillary force, when the at least one unit fuel cell is working.

13.-16. (Cancelled).

17. (Previously presented) A fuel cell assembly of claim 47, wherein the hydrophilic water-retaining layer has a mean micro-pore diameter of 10 to 300 μm and a thickness of 50 to 300 μm , and is provided to be in contact with the water permeable layer, said water permeable layer facing flow channels of fuel gas and

oxidizing gas of said unit fuel cell and has one surface to supply water to said flow channels, whereby water is retained by capillary force by said water-retaining layer when the unit fuel cell is not working and is taken by gas fed to said anode and gas fed to said cathode against the capillary force when the unit fuel cell is working; and water is supplied from only a part of a surface opposite to the water supplying surface and/or from the outer edge of said water-retaining layer.

18. (Previously presented) A fuel cell assembly of claim 48, wherein, the water-retaining layer is made of a hydrophilic porous member having a mean micro-pore diameter of 10 to 300 μm and a thickness of 50 to 300 μm , whereby water is retained by capillary force by said water-retaining layer when the stack of unit fuel cells is not working and is taken by gas fed to an anode of said unit fuel cell and gas fed to a cathode of said unit fuel cell by means of said water permeable layer against the capillary force when the unit fuel cell is working, said water-retaining layer being communicated with the water flow channel by means only of a porous humidifying water inlet means.

19. (Cancelled).

20. (Previously presented) The fuel cell assembly according to claim 47, having at least two water-retaining layers.

21. (Previously presented) The fuel cell assembly according to claim 48, wherein a carbonaceous porous filter controls flow rate of water to the water-retaining layer.

22. (Cancelled).

23. (Previously presented) The fuel cell assembly according to claim 47, wherein said water-retaining layer is a polypropylene non-woven cloth or a polyethylene-polypropylene non-woven cloth that is made hydrophilic.

24.-28. (Cancelled).

29. (Previously presented) The fuel cell assembly according to claim 47, wherein the water-retaining layer takes water thereinto at a peripheral portion thereof, where the water-retaining layer is in contact with cooling water.

30. and 31. (Cancelled).

32. (Previously presented) The fuel cell assembly according to claim 47, said fuel cell assembly having a single humidifier.

33. (Previously presented) A fuel cell assembly comprising a humidifier and a plurality of fuel cell units, wherein each of the fuel cell units comprises an electrolyte membrane, a cathode adjacent to one face of the membrane, an anode adjacent to the other face of the membrane, a gas diffusion layer adjacent to the cathode, a gas diffusion layer adjacent to the anode, a separator having a flow channel on one face thereof for flowing oxidizing gas, which is adjacent to the cathode, and a separator

having a flow channel for flowing fuel gas, which is adjacent to the anode, wherein the humidifier comprises a porous water-retaining layer for retaining water supplied thereto, and a holder for the water-retaining layer, wherein a surface of the holder for the water-retaining layer and an adjacent surface of the water-retaining layer are in contact over entire surfaces thereof, wherein the water-retaining layer is made of a hydrophilic polymer material, said porous water-retaining layer being in communication with a channel containing water by way of a filter between said channel and said water-retaining layer for passing water, but not gas, from said channel to said water-retaining layer, said channel containing water exclusively supplying water to the water-retaining layer, supplying water thereto via the filter, wherein the water-retaining layer communicates with the channel containing water by way of the filter, which is disposed at a position where the cooling water inlet and the water-retaining layer communicate with each other, wherein the water-retaining layer takes water thereto at a peripheral portion thereof, where the water-retaining layer is in contact with cooling water, and wherein the humidifier adjoins an end of the plurality of the fuel cell units in such a relation that the water-retaining layer faces the flow channels thereby to transfer water introduced into the water-retaining layer to the fuel gas and/or oxidizing gas flowing in the flow channels, the flow channels for flowing gases being partitioned with a wall from the channel containing water.

34.-39. (Cancelled).

40. (Previously presented) The fuel cell assembly according to claim 33, said fuel cell assembly having a single humidifier.

41. (Previously presented) The fuel cell assembly according to claim 47, wherein the water-retaining layer comprises a hydrogen oxidation catalyst dispersed in a porous member.

42. (Previously presented) The fuel cell assembly according to claim 48, wherein the water-retaining layer comprises a hydrogen oxidation catalyst dispersed in a porous member.

43. (Previously presented) The fuel cell assembly according to claim 33, wherein the water-retaining layer comprises a hydrogen oxidation catalyst dispersed in a porous member.

44. and 45. (Cancelled).

46. (Previously presented) The fuel cell assembly according to claim 33, wherein said filter is a porous carbonaceous filter.

47. (Currently amended) A fuel cell assembly comprising:
a unit fuel cell comprising a membrane electrode assembly;
a humidifier comprising:
a water-retaining layer for retaining water therein, said water-retaining layer being made of hydrophilic porous material,

a water permeable layer in face-to-face contact with said water-retaining layer for humidifying gas in the gas channel of a separator, said water permeable layer being made of a hydrophilic porous material that passes water, but not gas;

the separator having a gas channel facing said water permeable layer on one face and facing the unit fuel cell on the other face; and

a humidifier holding member for holding peripheries of the water-retaining layer, water permeable layer, and unit fuel cell, wherein the humidifier holding memberholder, which is partitioned from a gas flow channel with a wall member, is provided with a water flow channel therein to exclusively supply water to the water-retaining layer.

48. (Currently amended) A fuel cell assembly comprising:

a unit fuel cell comprising a membrane electrode assembly; and

a humidifier comprising:

a water-retaining layer for retaining water therein, said water-retaining layer being made of hydrophilic porous material;

a separator having a gas channel facing the water-retaining layer on one face and facing the unit fuel cell on the other face;

a filter made of a hydrophilic porous material being disposed between (a) a water channel for supplying water to the water-retaining layer, and (b) the water-retaining layer; and

a humidifier holding member for holding peripheries of the water-retaining layer and the unit fuel cell, wherein the water-retaining layer supplies water

to gas passing in the gas channel to humidify it, and wherein the humidifier holding member~~holder~~, which is partitioned from a gas flow channel with a wall member, is provided with the water channel therein to exclusively supply water to the water-retaining layer, supplying the water thereto via the filter.

49. (Previously presented) The fuel cell assembly according to claim 33, wherein the water-retaining layer is positioned and has structure such that water osmoses into and through the water-retaining layer by capillary action so as to be supplied from said channel to the flow channels thereby to transfer water introduced into the water-retaining layer to the fuel gas and/or oxidizing gas flowing in the flow channels.

50. (Currently amended) The fuel cell assembly according to claim 47, further comprising a holder for the water-retaining layer, and wherein a surface of the holder and an adjacent surface of the water-retaining layer are in contact over entire adjacent surfaces thereof, and a surface of the water-retaining layer and an adjacent surface of the water permeable layer are in contact over entire adjacent surfaces thereof.

51. (Currently amended) The fuel cell assembly according to claim 48, further comprising a holder for the water-retaining layer, and wherein the holder is in face-to-face contact over an entirety of a surface of the water-retaining layer adjacent thereto.

52. (Previously presented) A fuel cell assembly comprising a humidifier and a plurality of fuel cell units, wherein each of the fuel cell units comprises an electrolyte membrane, a cathode adjacent to one face of the membrane, an anode adjacent to the other face of the membrane, a gas diffusion layer adjacent to the cathode, a gas diffusion layer adjacent to the anode, a separator having a flow channel on one face thereof for flowing oxidizing gas, which is adjacent to the cathode, and a separator having a flow channel for flowing fuel gas, which is adjacent to the anode, wherein the humidifier comprises a water permeable layer, a porous water-retaining layer for retaining water supplied thereto, and a holder for the water-retaining layer, wherein a surface of the holder for the water-retaining layer and an adjacent surface of the water-retaining layer are in contact over entire adjacent surfaces thereof, and a surface of the water-retaining layer and an adjacent surface of the water permeable layer are in contact over entire adjacent surfaces thereof, wherein the water-retaining layer is made of a hydrophilic polymer material, said porous water-retaining layer being in communication with a channel containing water by way of an edge of the water-retaining layer in contact with the channel, for passing water, but not gas, said channel containing water exclusively supplying water to the water-retaining layer, supplying water thereto via the edge of the water-retaining layer, wherein the water-retaining layer communicates with the channel containing water by way of the edge of the water-retaining layer, which is disposed at a position where the cooling water inlet and the water-retaining layer communicate with each other, wherein the water-retaining layer takes water thereinto at a peripheral portion thereof, where the water-retaining layer is in contact with cooling water, and wherein the humidifier adjoins an end of the plurality of the fuel cell units

in such a relation that the water-retaining layer faces the flow channels thereby to transfer water introduced into the water-retaining layer to the fuel gas and/or oxidizing gas flowing in the flow channels, the flow channels for flowing gases being partitioned with a wall from the channel containing water.

53. (Previously presented) The fuel cell assembly according to claim 52, wherein the water-retaining layer is positioned and has structure such that water osmoses into and through the water-retaining layer by capillary action so as to be supplied from said channel to the water permeable layer and then to the flow channels thereby to transfer water introduced into the water-retaining layer to the fuel gas and/or oxidizing gas flowing in the flow channels.

54. (Previously presented) The fuel cell assembly according to claim 52, wherein the water-retaining layer comprises a hydrogen oxidation catalyst dispersed in a porous member.